

Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the present application.

Claim Listing

1 1. (Original) A method of negotiating point-to-point protocol (PPP), the method
2 comprising:
3 receiving a first configuration request packet at a first network element for a
4 network connection from a second network element;
5 responding with a first packet; and
6 if a first response to said first packet is expected by said first network element,
7 determining expected contents of said first response, and
8 if said expected contents of said first response to said first packet require a
9 response,
10 responding with a second packet before receiving said first
11 response.

1 2. (Currently Amended) The method of claim 1, further comprising:
2 sending a second configuration request packet to said second network element.

1 3. (Original) The method of claim 1, further comprising:
2 if said first configuration request packet includes at least one unsupported option,
3 responding with a configuration reject packet.

1 4. (Original) The method of claim 3, further comprising:
2 if said first configuration request packet includes at least one supported option
3 having at least one unsupported value,
4 responding with at least one configuration-NAK packet for said supported
5 option having at least one unsupported value.

1 5. (Original) The method of claim 4, wherein said configuration-NAK packet
2 includes at least one suggested supported value for said supported option having at least
3 one unsupported value.

1 6. (Currently Amended) The method of claim ~~4~~ 5, further comprising:
2 responding with a first configuration-ACK packet having said supported option
3 with said suggested supported value before receiving a response to said
4 configuration-NAK packet.

1 7. (Original) The method of claim 6, further comprising:
2 starting a re-send timer.

1 8. (Original) The method of claim 7, wherein a value of said re-send timer is
2 dynamically determined according to a network traffic condition.

1 9. (Original) The method of claim 7, further comprising:
2 setting a state of said network connection to 'ACK-sent' after sending said first
3 configuration-ACK packet.

1 10. (Currently Amended) The method of claim 7, further comprising:
2 setting ~~said a~~ a state of said network connection to 'open' after sending said first
3 configuration-ACK packet.

1 11. (Original) The method of claim 8, further comprising:
2 if said re-send timer expires before a response to said second configuration
3 request packet is received,
4 re-sending said first configuration-ACK packet,
5 restarting said re-send timer, and
6 repeating said steps of re-sending and restarting until said response to said
7 second configuration request packet is received.

1 12. (Original) The method of claim 11, further comprising:
2 if said response to said second configuration request packet is received,
3 analyzing said response to said second configuration request packet.

1 13. (Original) The method of claim 12, further comprising:
2 if said response to said second configuration request packet is a second
3 configuration-ACK packet,
4 setting said state of said network connection to 'open', and
5 discarding any further responses.

1 14. (Currently Amended) The method of claim 12, further comprising:
2 if said response to said second configuration request packet is not said a second
3 configuration-ACK packet,
4 resetting said state of said network connection, and
5 initiating conventional PPP negotiation.

1 15. (Currently Amended) The method of claim 10, further comprising:
2 if said re-send timer expires before said a response to said second configuration
3 request packet is received,
4 re-sending said first configuration-ACK packet,
5 resetting said state of said network connection to 'ACK-sent',
6 restarting said re-send timer, and
7 repeating said steps of re-sending and restarting until said response to said
8 second configuration request packet is received.

1 16. (Original) The method of claim 15, further comprising:
2 if said response to said second configuration request packet is received,
3 analyzing said response to said second configuration request packet.

1 17. (Original) The method of claim 16, further comprising:
2 if said response to said second configuration request packet is said second
3 configuration-ACK packet,
4 determining said state of said network connection, and
5 if said state of said network connection is not set to 'open',
6 setting said state of said network connection to 'open'.

1 18. (Original) The method of claim 17, further comprising:
2 discarding any further responses.

1 19. (Original) The method of claim 16, further comprising:
2 if said response to said second configuration request packet is not said second
3 configuration-ACK packet,
4 resetting said state of said network connection.

1 20. (Original) A network element comprising:
2 means for receiving a first configuration request packet at a first network element
3 for a network connection from a second network element;
4 means for responding with a first packet;
5 means for determining expected contents of said first response if a first response
6 to said first packet is expected by said first network element; and
7 means for responding with a second packet before receiving said first response if
8 said expected contents of said first response to said first packet require a
9 response.

1 21. (Currently Amended) The network element of claim 20, further comprising:
2 means for sending a second configuration request packet to said second network
3 element.

1 22. (Original) The network element of claim 20, further comprising:
2 means for responding with a configuration reject packet if said first configuration
3 request packet includes at least one unsupported option.

1 23. (Original) The network element of claim 22, further comprising:
2 means for responding with at least one configuration-NAK packet for said
3 supported option having at least one unsupported value if said first
4 configuration request packet includes at least one supported option having
5 at least one unsupported value.

1 24. (Original) The network element of claim 23, wherein said configuration-
2 NAK packet includes at least one suggested supported value for said supported option
3 having at least one unsupported value.

1 25. (Currently Amended) The network element of claim ~~23~~ 24, further
2 comprising:
3 means for responding with a first configuration-ACK packet having said
4 supported option with said suggested supported value before receiving a
5 response to said configuration-NAK packet.

1 26. (Original) The network element of claim 25, further comprising:
2 means for starting a re-send timer.

1 27. (Original) The network element of claim 26, wherein a value of said re-send
2 timer is dynamically determined according to a network traffic condition.

1 28. (Original) The network element of claim 26, further comprising:
2 means for setting a state of said network connection to 'ACK-sent' after sending
3 said first configuration-ACK packet.

1 29. (Currently Amended) The network element of claim 26, further comprising:
2 means for setting said a state of said network connection to 'open' after sending
3 said first configuration-ACK packet.

1 30. (Original) The network element of claim 27, further comprising:
2 means for re-sending said first configuration-ACK packet if said re-send timer
3 expires before a response to said second configuration request packet is
4 received;
5 means for restarting said re-send timer if said re-send timer expires before a
6 response to said second configuration request packet is received; and
7 means for repeating said steps of re-sending and restarting until said response to
8 said second configuration request packet is received if said re-send timer
9 expires before a response to said second configuration request packet is
10 received.

1 31. (Original) The network element of claim 30, further comprising:
2 means for analyzing said response to said second configuration request packet if
3 said response to said second configuration request packet is received.

1 32. (Original) The network element of claim 31, further comprising:
2 means for setting said state of said network connection to 'open' if said response
3 to said second configuration request packet is a second configuration-
4 ACK packet; and
5 means for discarding any further responses if said response to said second
6 configuration request packet is a second configuration-ACK packet.

1 33. (Currently Amended) The network element of claim 31, further comprising:
2 means for resetting said state of said network connection if said response to said
3 second configuration request packet is not said a second configuration-
4 ACK packet; and

5 means for initiating conventional PPP negotiation if said response to said second
6 configuration request packet is not said second configuration-ACK packet.

1 34. (Currently Amended) The network element of claim 29, further comprising:

2 means for re-sending said first configuration-ACK packet if said re-send timer
3 expires before said a response to said second configuration request packet
4 is received;

5 means for resetting said state of said network connection to 'ACK-sent' if said re-
6 send timer expires before said response to said second configuration
7 request packet is received;

8 means for restarting said re-send timer if said re-send timer expires before said
9 response to said second configuration request packet is received; and

10 means for repeating said steps of re-sending and restarting until said response to
11 said second configuration request packet is received if said re-send timer
12 expires before said response to said second configuration request packet is
13 received.

1 35. (Original) The network element of claim 34, further comprising:

2 means for analyzing said response to said second configuration request packet if
3 said response to said second configuration request packet is received.

1 36. (Original) The network element of claim 35, further comprising:

2 means for determining said state of said network connection if said response to
3 said second configuration request packet is said second configuration-
4 ACK packet; and

5 means for setting said state of said network connection to 'open' if said state of
6 said network connection is not set to 'open'.

1 37. (Original) The network element of claim 36, further comprising:

2 means for discarding any further responses.

1 38. (Currently Amended) The network element of claim 16 35, further
2 comprising:
3 means for resetting said state of said network connection if said response to said
4 second configuration request packet is not said second configuration-ACK
5 packet.

1 39. (Original) A network element comprising:
2 a processor; and
3 a network interface coupled to said processor, wherein said processor is
4 configured to
5 receive a first configuration request packet at a first network element for a
6 network connection from a second network element,
7 respond with a first packet, and
8 if a first response to said first packet is expected by said first network
9 element,
10 determine expected contents of said first response, and
11 if said expected contents of said first response to said first packet
12 require a response,
13 respond with a second packet before receiving said first
14 response.

1 40. (Currently Amended) The network element of claim 39, wherein said
2 processor is further configured to
3 sending a second configuration request packet to said second network element.

1 41. (Original) The network element of claim 39, wherein said processor is
2 further configured to
3 respond with a configuration reject packet if said first configuration request
4 packet includes at least one unsupported option.

1 42. (Currently Amended) The network element of claim 3 41, wherein said
2 processor is further configured to
3 respond with at least one configuration-NAK packet for said supported option
4 having at least one unsupported value if said first configuration request
5 packet includes at least one supported option having at least one
6 unsupported value.

1 43. (Original) The network element of claim 42, wherein said configuration-
2 NAK packet includes at least one suggested supported value for said supported option
3 having at least one unsupported value.

1 44. (Currently Amended) The network element of claim 42 43, wherein said
2 processor is further configured to
3 respond with a first configuration-ACK packet having said supported option with
4 said suggested supported value before receiving a response to said
5 configuration-NAK packet.

1 45. (Currently Amended) The network element of claim 6 44, wherein said
2 processor is further configured to
3 start a re-send timer.

1 46. (Original) The network element of claim 45, wherein a value of said re-send
2 timer is dynamically determined according to a network traffic condition.

1 47. (Original) The network element of claim 45, wherein said processor is
2 further configured to
3 set a state of said network connection to 'ACK-sent' after sending said first
4 configuration-ACK packet.

1 48. (Currently Amended) The network element of claim 45, wherein said
2 processor is further configured to
3 set said a state of said network connection to 'open' after sending said first
4 configuration-ACK packet.

1 49. (Original) The network element of claim 46, wherein said processor is
2 further configured to
3 re-send said first configuration-ACK packet if said re-send timer expires before a
4 response to said second configuration request packet is received;
5 restart said re-send timer if said re-send timer expires before a response to said
6 second configuration request packet is received; and
7 repeat said steps of re-sending and restarting until said response to said second
8 configuration request packet is received if said re-send timer expires
9 before a response to said second configuration request packet is received.

1 50. (Original) The network element of claim 49, wherein said processor is
2 further configured to
3 analyze said response to said second configuration request packet if said response
4 to said second configuration request packet is received.

1 51. (Original) The network element of claim 50, wherein said processor is
2 further configured to
3 set said state of said network connection to 'open' if said response to said second
4 configuration request packet is a second configuration-ACK packet; and
5 discard any further responses if said response to said second configuration request
6 packet is a second configuration-ACK packet.

1 52. (Currently Amended) The network element of claim 50, wherein said
2 processor is further configured to
3 reset said state of said network connection if said response to said second
4 configuration request packet is not said a second configuration-ACK
5 packet; and
6 initiate conventional PPP negotiation if said response to said second configuration
7 request packet is not said second configuration-ACK packet.

1 53. (Currently Amended) The network element of claim 48, wherein said
2 processor is further configured to
3 re-send said first configuration-ACK packet if said re-send timer expires before
4 said a response to said second configuration request packet is received;
5 reset said state of said network connection to 'ACK-sent' if said re-send timer
6 expires before said response to said second configuration request packet is
7 received;
8 restart said re-send timer if said re-send timer expires before said response to said
9 second configuration request packet is received; and
10 repeat said steps of re-sending and restarting until said response to said second
11 configuration request packet is received if said re-send timer expires
12 before said response to said second configuration request packet is
13 received.

1 54. (Original) The network element of claim 53, wherein said processor is
2 further configured to
3 analyze said response to said second configuration request packet if said response
4 to said second configuration request packet is received.

1 55. (Original) The network element of claim 54, wherein said processor is
2 further configured to
3 determine said state of said network connection if said response to said second
4 configuration request packet is said second configuration-ACK packet;
5 and
6 set said state of said network connection to 'open' if said state of said network
7 connection is not set to 'open'.

1 56. (Original) The network element of claim 55, wherein said processor is
2 further configured to
3 discard any further responses.

1 57. (Original) The network element of claim 54, wherein said processor is
2 further configured to
3 reset said state of said network connection if said response to said second
4 configuration request packet is not said second configuration-ACK packet.

1 58. (Original) A computer program product for negotiating point-to-point
2 protocol (PPP), encoded in computer readable media, said program product comprising a
3 set of instructions executable on a computer system, wherein said set of instructions
4 configured to
5 receive a first configuration request packet at a first network element for a
6 network connection from a second network element;
7 respond with a first packet; and
8 if a first response to said first packet is expected by said first network element,
9 determine expected contents of said first response, and
10 if said expected contents of said first response to said first packet require a
11 response,
12 respond with a second packet before receiving said first response.

1 59. (Currently Amended) The computer program product of claim 58, wherein
2 said set of instructions is further configured to
3 send a second configuration request packet to said second network element.

1 60. (Original) The computer program product of claim 58, wherein said set of
2 instructions is further configured to
3 if said first configuration request packet includes at least one unsupported option,
4 respond with a configuration reject packet.

1 61. (Original) The computer program product of claim 60, wherein said set of
2 instructions is further configured to
3 if said first configuration request packet includes at least one supported option
4 having at least one unsupported value,
5 respond with at least one configuration-NAK packet for said supported
6 option having at least one unsupported value.

1 62. (Original) The computer program product of claim 61, wherein said
2 configuration-NAK packet includes at least one suggested supported value for said
3 supported option having at least one unsupported value.

1 63. (Currently Amended) The computer program product of claim ~~61~~ 62,
2 wherein said set of instructions is further configured to
3 respond with a first configuration-ACK packet having said supported option with
4 said suggested supported value before receiving a response to said
5 configuration-NAK packet.

1 64. (Original) The computer program product of claim 63, wherein said set of
2 instructions is further configured to
3 start a re-send timer.

1 65. (Original) The computer program product of claim 64, wherein a value of
2 said re-send timer is dynamically determined according to a network traffic condition.

1 66. (Original) The computer program product of claim 64, wherein said set of
2 instructions is further configured to
3 set a state of said network connection to 'ACK-sent' after sending said first
4 configuration-ACK packet.

1 67. (Currently Amended) The computer program product of claim 64, wherein
2 said set of instructions is further configured to
3 set ~~said~~ a state of said network connection to 'open' after sending said first
4 configuration-ACK packet.

1 68. (Original) The computer program product of claim 65, wherein said set of
2 instructions is further configured to
3 if said re-send timer expires before a response to said second configuration
4 request packet is received,
5 re-send said first configuration-ACK packet,
6 restart said re-send timer, and
7 repeat said steps of re-sending and restarting until said response to said
8 second configuration request packet is received.

1 69. (Original) The computer program product of claim 68, wherein said set of
2 instructions is further configured to
3 if said response to said second configuration request packet is received,
4 analyze said response to said second configuration request packet.

1 70. (Original) The computer program product of claim 69, wherein said set of
2 instructions is further configured to
3 if said response to said second configuration request packet is a second
4 configuration-ACK packet,

5 set said state of said network connection to 'open', and
6 discard any further responses.

1 71. (Currently Amended) The computer program product of claim 69, wherein
2 said set of instructions is further configured to
3 if said response to said second configuration request packet is not said a second
4 configuration-ACK packet,
5 reset said state of said network connection, and
6 initiate conventional PPP negotiation.

1 72. (Currently Amended) The computer program product of claim 67, wherein
2 said set of instructions is further configured to
3 if said re-send timer expires before said a response to said second configuration
4 request packet is received,
5 re-send said first configuration-ACK packet,
6 reset said state of said network connection to 'ACK-sent',
7 restart said re-send timer, and
8 repeat said steps of re-sending and restarting until said response to said
9 second configuration request packet is received.

1 73. (Original) The computer program product of claim 72, wherein said set of
2 instructions is further configured to
3 if said response to said second configuration request packet is received,
4 analyze said response to said second configuration request packet.

1 74. (Original) The computer program product of claim 73, wherein said set of
2 instructions is further configured to
3 if said response to said second configuration request packet is said second
4 configuration-ACK packet,
5 determine said state of said network connection, and
6 if said state of said network connection is not set to 'open',
7 set said state of said network connection to 'open'.

1 75. (Original) The computer program product of claim 74, wherein said set of
2 instructions is further configured to
3 discard any further responses.

1 76. (Original) The computer program product of claim 73, wherein said set of
2 instructions is further configured to
3 if said response to said second configuration request packet is not said second
4 configuration-ACK packet,
5 reset said state of said network connection